Fig.1

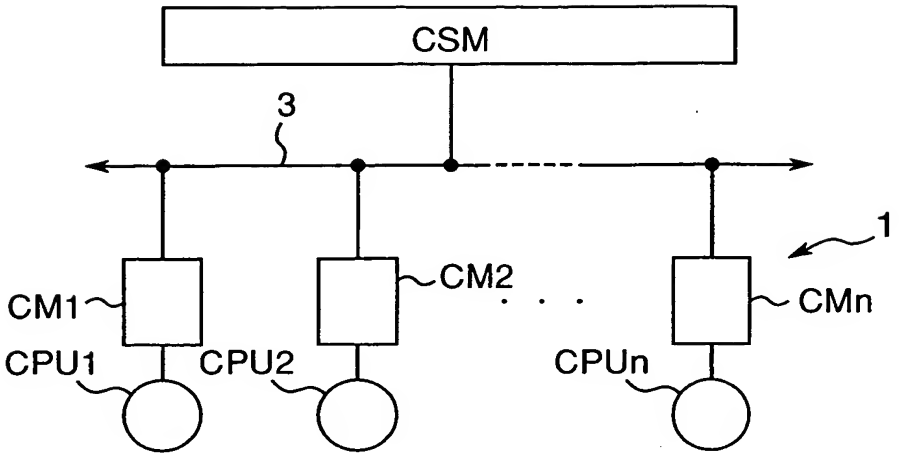
CSM
3
1
CM1
CM2
CMn
CPU1
CPU2
CPUn

Fig.2

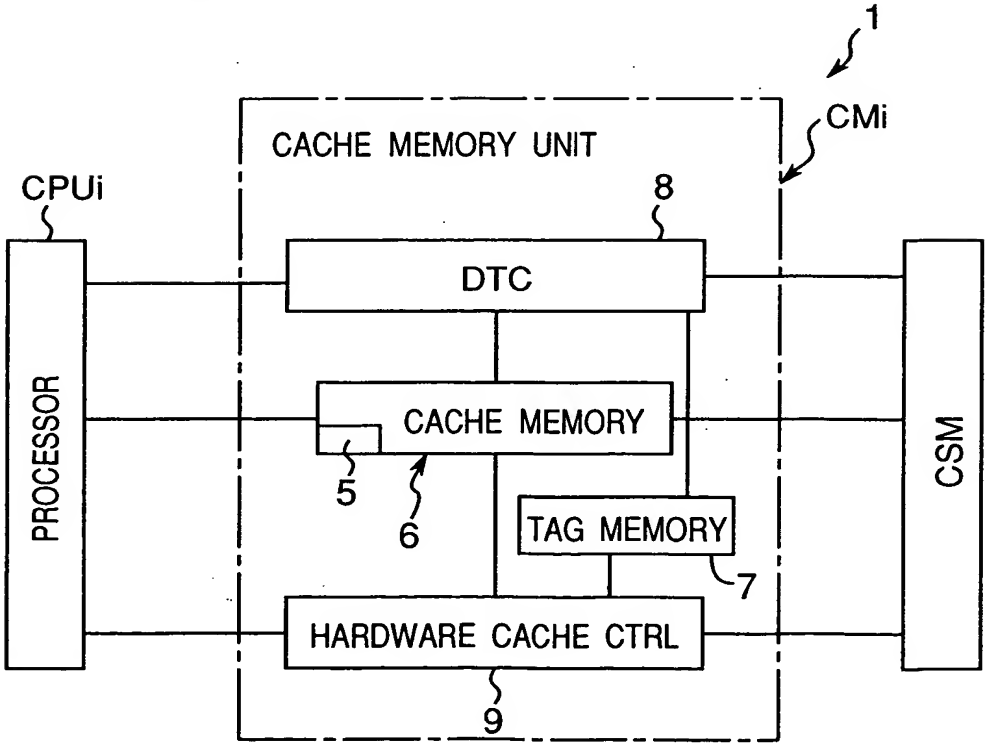
1
CMi
CACHE MEMORY UNIT
CPUi
8
DTC
PROCESSOR
CACHE MEMORY
CSM
5
6
TAG MEMORY
7
HARDWARE CACHE CTRL
9

Fig.3

TAG	KEY			
	1ST WAY	2ND WAY	3RD WAY	4TH WAY
0	16	24	—	—
1	01	09	17	25
2	18	10	02	—
3	11	43	19	27
4	20	28	—	—
5	05	13	21	29
6	14	22	—	—
7	07	23	31	—

Fig.4

TAG	KEY			
	1ST WAY	2ND WAY	3RD WAY	4TH WAY
0	16	24	—	37
1	01	09	17	25
2	18	10	02	45
3	11	43	19	27
4	20	28	—	33
5	05	13	21	29
6	14	22	—	53
7	07	23	31	—

Fig.5

TAG	KEY			
	1ST WAY	2ND WAY	3RD WAY	4TH WAY
0	16	24	—	—
1	01	09	17	25
2	18	10	02	—
3	11	43	19	—
4	20	28	—	—
5	05	13	21	—
6	14	22	—	—
7	07	23	31	—

Fig.6

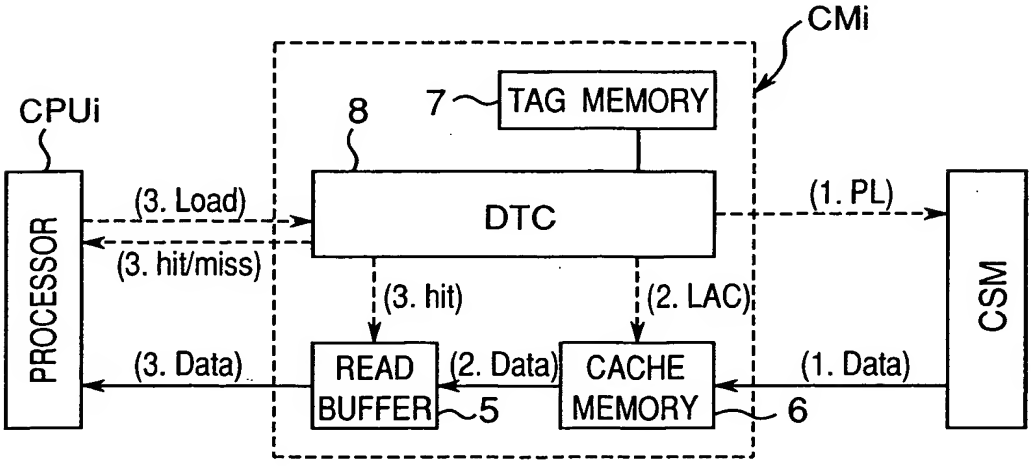

Fig.7

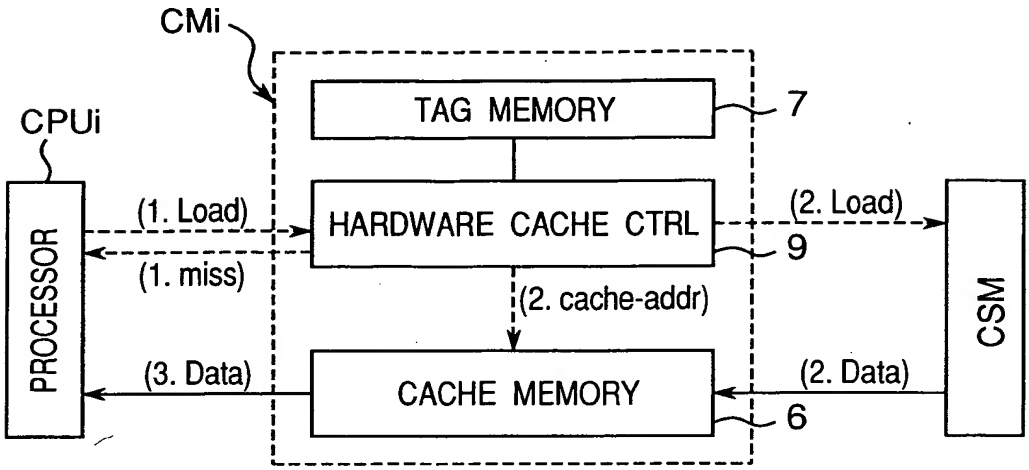
CMi
CPUi
TAG MEMORY
7
PROCESSOR
(1. Load)
HARDWARE CACHE CTRL
(2. Load)
9
(1. miss)
(2. cache-addr)
CSM
(3. Data)
CACHE MEMORY
(2. Data)
6

Fig.8

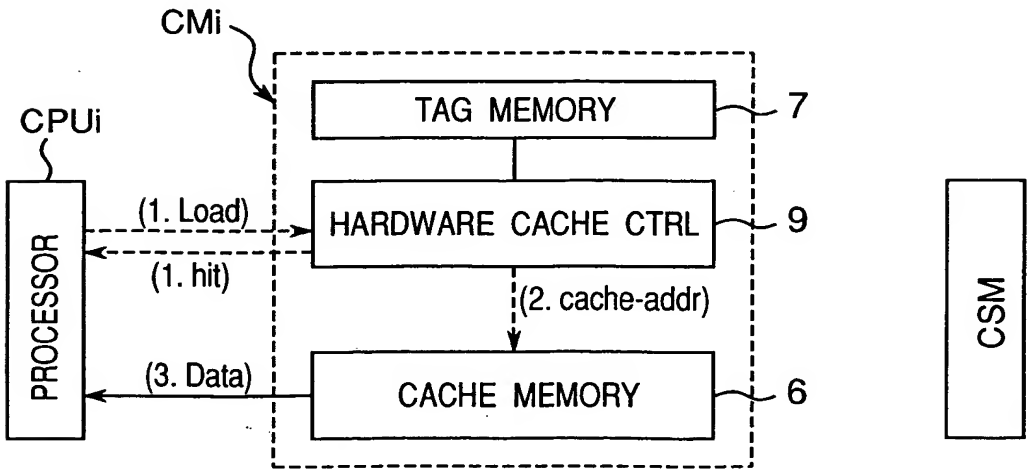
CMi
CPUi
TAG MEMORY
7
PROCESSOR
(1. Load)
HARDWARE CACHE CTRL
9
(1. hit)
(2. cache-addr)
CSM
(3. Data)
CACHE MEMORY
6

Fig.9

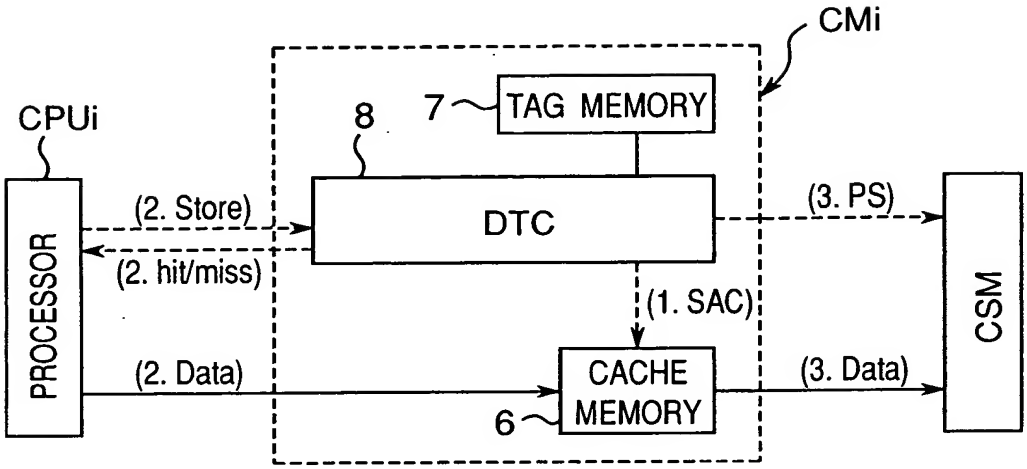
CMi
CPUi
8
7
TAG MEMORY
PROCESSOR
(2. Store)
(2. hit/miss)
DTC
(3. PS)
CSM
(1. SAC)
(2. Data)
CACHE MEMORY
6
(3. Data)

Fig.10

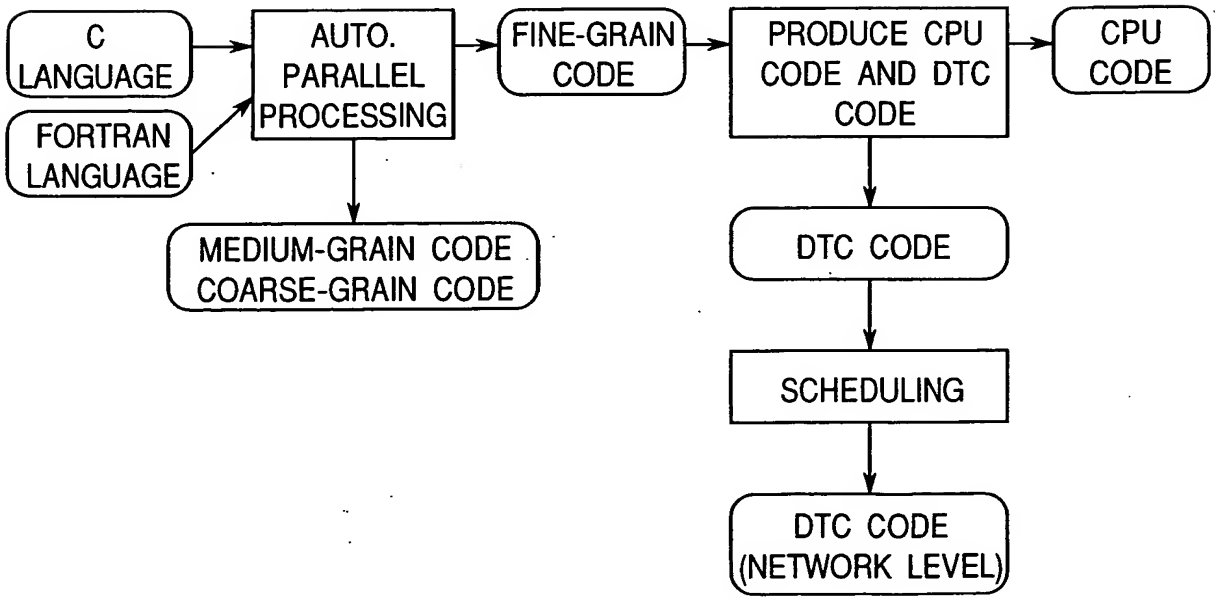
C LANGUAGE
FORTRAN LANGUAGE
AUTO. PARALLEL PROCESSING
FINE-GRAIN CODE
PRODUCE CPU CODE AND DTC CODE
CPU CODE
MEDIUM-GRAIN CODE COARSE-GRAIN CODE
DTC CODE
SCHEDULING
DTC CODE (NETWORK LEVEL)

Fig.11

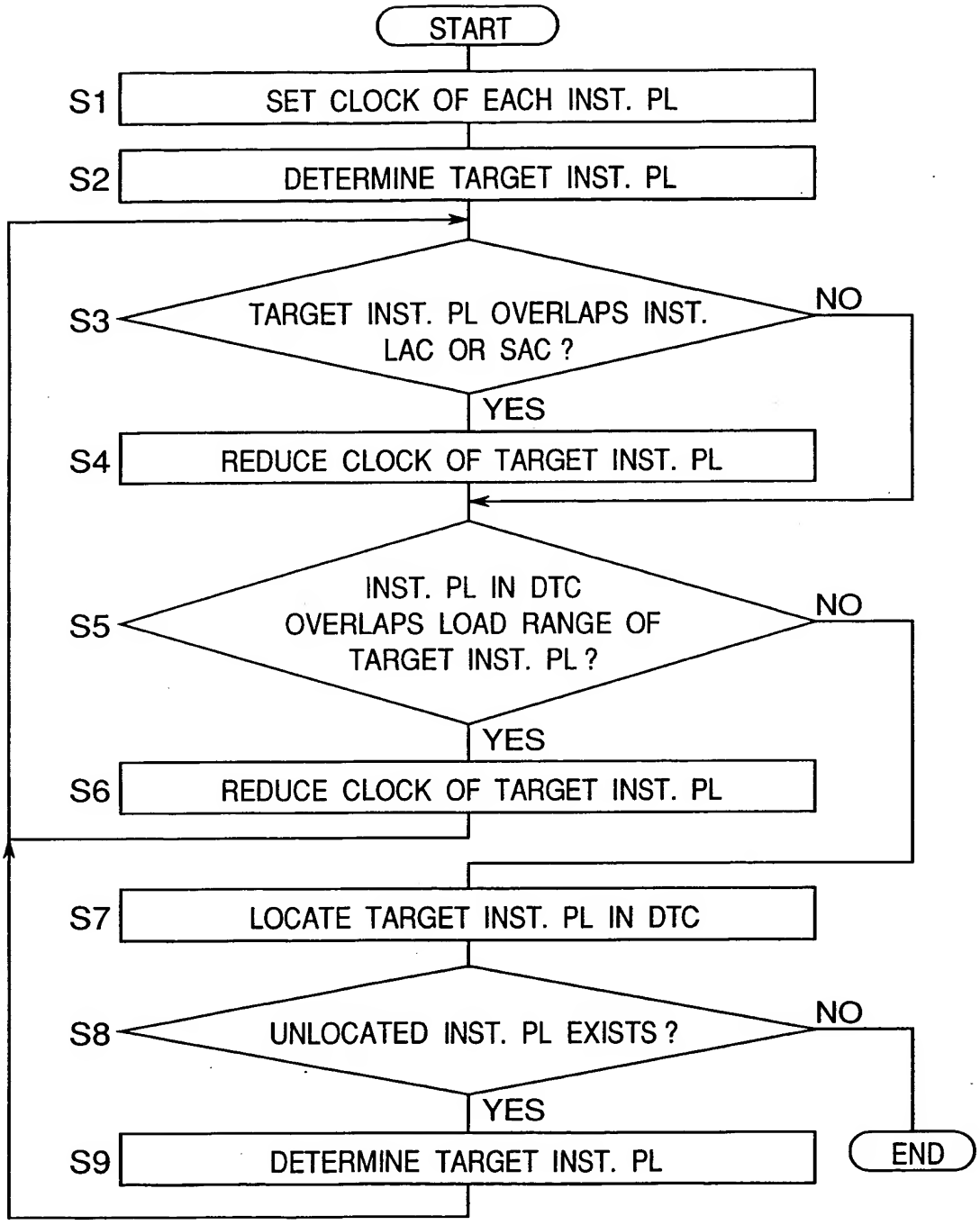
START
S1
SET CLOCK OF EACH INST. PL
S2
DETERMINE TARGET INST. PL
S3
TARGET INST. PL OVERLAPS INST. LAC OR SAC ?
NO
YES
S4
REDUCE CLOCK OF TARGET INST. PL
S5
INST. PL IN DTC OVERLAPS LOAD RANGE OF TARGET INST. PL ?
NO
YES
S6
REDUCE CLOCK OF TARGET INST. PL
S7
LOCATE TARGET INST. PL IN DTC
S8
UNLOCATED INST. PL EXISTS ?
NO
YES
S9
DETERMINE TARGET INST. PL
END

Fig.12

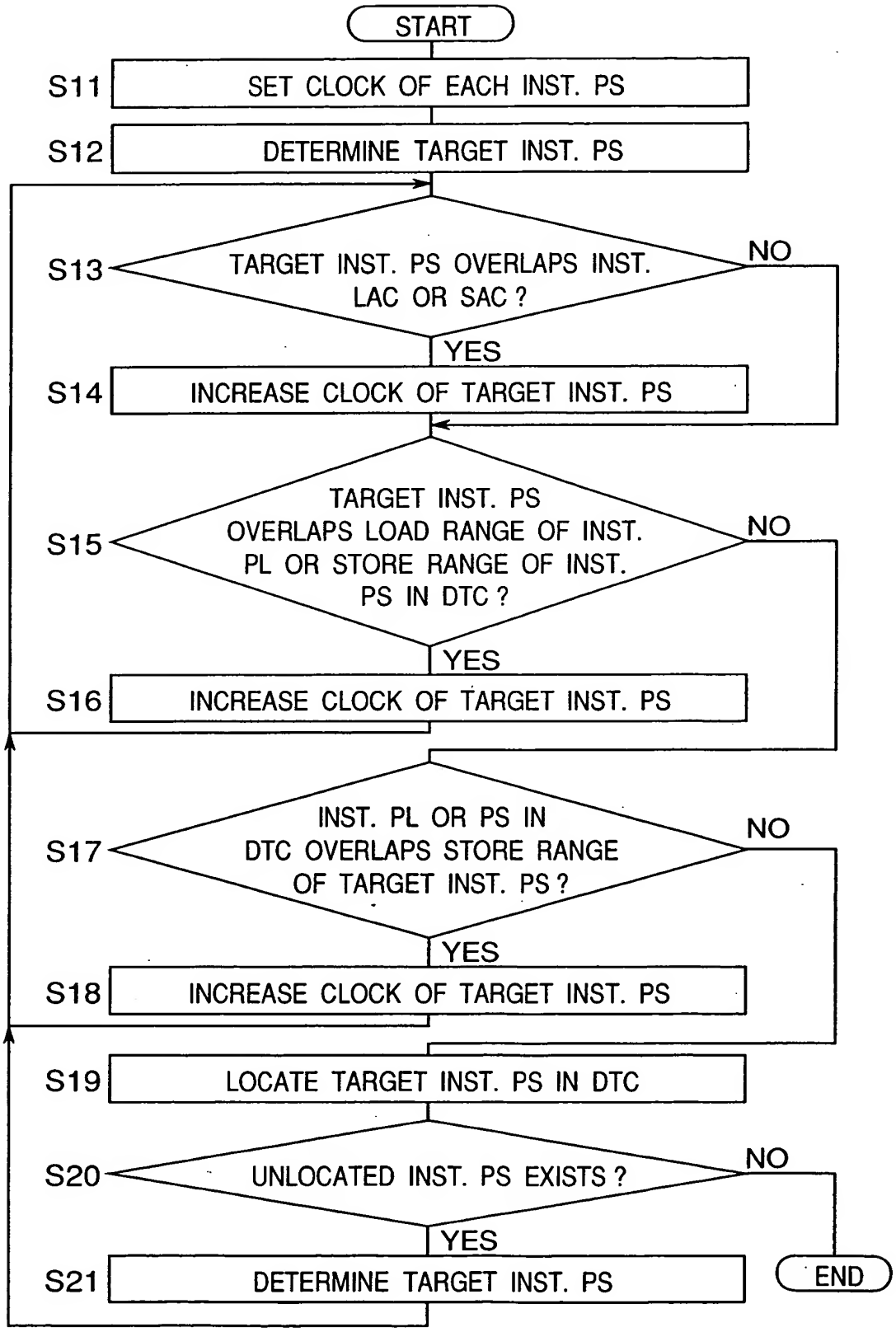
START
S11
SET CLOCK OF EACH INST. PS
S12
DETERMINE TARGET INST. PS
S13
TARGET INST. PS OVERLAPS INST. LAC OR SAC ?
NO
YES
S14
INCREASE CLOCK OF TARGET INST. PS
S15
TARGET INST. PS OVERLAPS LOAD RANGE OF INST. PL OR STORE RANGE OF INST. PS IN DTC ?
NO
YES
S16
INCREASE CLOCK OF TARGET INST. PS
S17
INST. PL OR PS IN DTC OVERLAPS STORE RANGE OF TARGET INST. PS ?
NO
YES
S18
INCREASE CLOCK OF TARGET INST. PS
S19
LOCATE TARGET INST. PS IN DTC
S20
UNLOCATED INST. PS EXISTS ?
NO
YES
S21
DETERMINE TARGET INST. PS
END

Fig.13

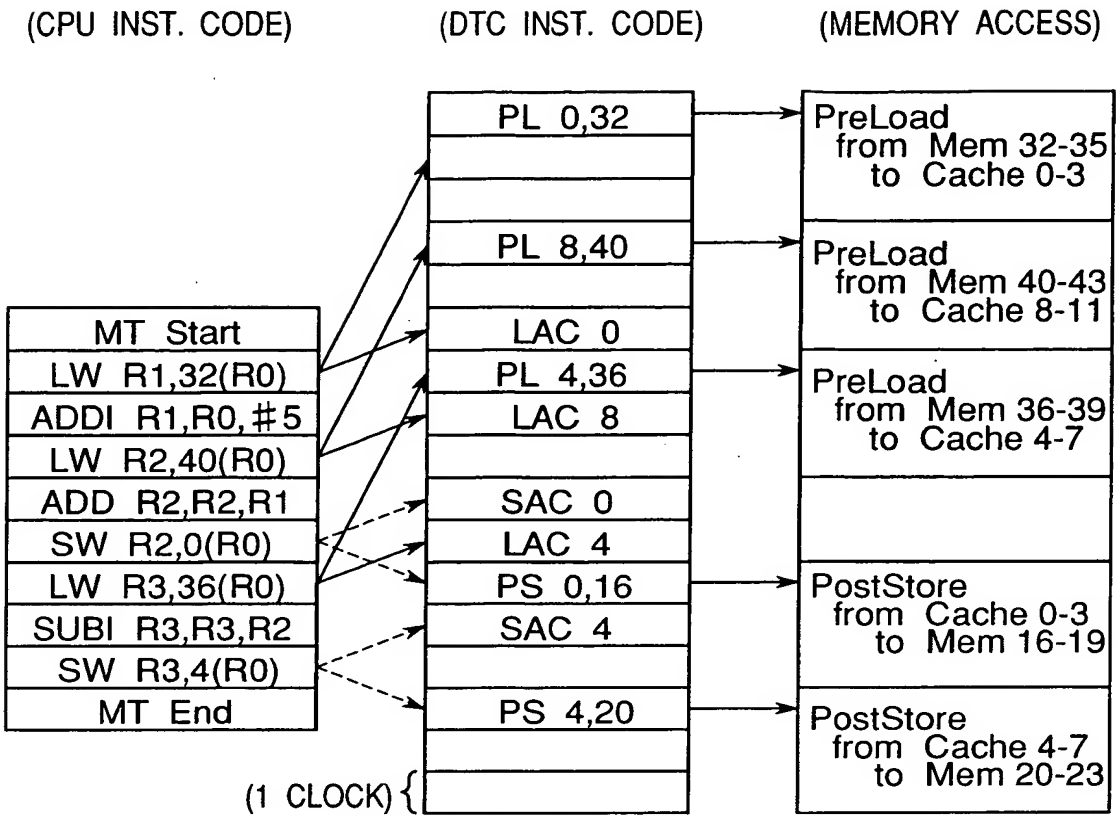
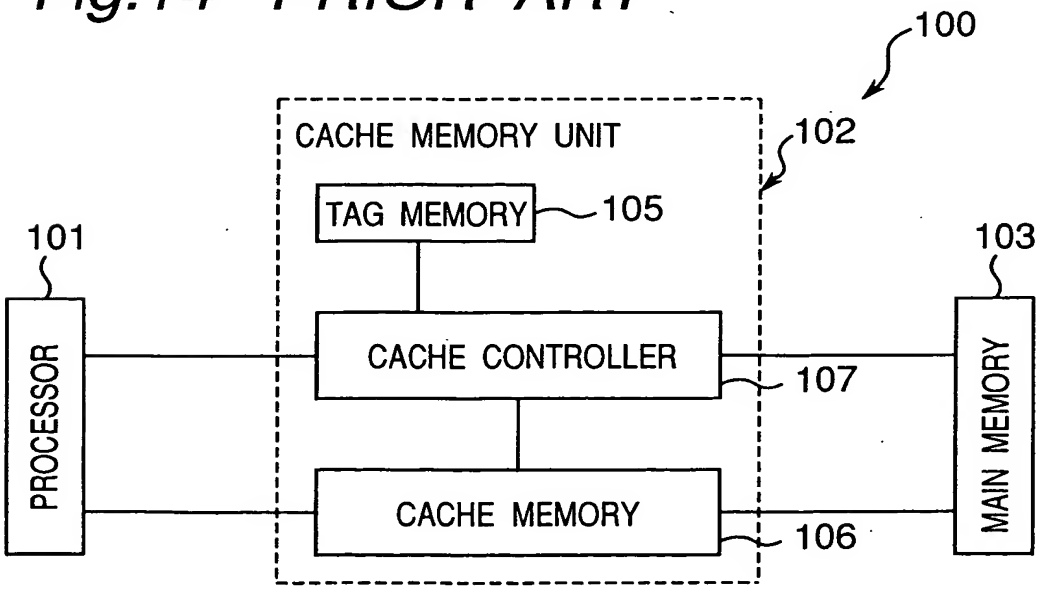
Fig.14 PRIOR ART